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25908 7590 07/29/2010

NOVOZYMES NORTH AMERICA, INC.
500 FIFTH AVENUE
SUITE 1600
NEW YORK, NY 10110

EXAMINER

MOORE, WILLIAM W

ART UNIT

PAPER NUMBER

1656

DATE MAILED: 07/29/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,554

04/03/2006

Leonardo De Maria

10508.204-US

9304

TITLE OF INVENTION: PROTEASE VARIANTS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	10/29/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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25908 7590 07/29/2010

NOVOZYMES NORTH AMERICA, INC.
500 FIFTH AVENUE
SUITE 1600
NEW YORK, NY 10110

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,554 04/03/2006 Leonardo De Maria 10508.204-US 9304

TITLE OF INVENTION: PROTEASE VARIANTS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1510 \$300 \$0 \$1810 10/29/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
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MOORE, WILLIAM W 1656 435-220000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date _____

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Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,554	04/03/2006	Leonardo De Maria	10508.204-US	9304
25908	7590	07/29/2010	EXAMINER	
NOVOZYMES NORTH AMERICA, INC. 500 FIFTH AVENUE SUITE 1600 NEW YORK, NY 10110			MOORE, WILLIAM W	
			ART UNIT	PAPER NUMBER
			1656	
DATE MAILED: 07/29/2010				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 693 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 693 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/574,554

Examiner

WILLIAM W. MOORE

Applicant(s)

DE MARIA ET AL.

Art Unit

1656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 2 June 2010 and the interview conducted 23 July 2010.
2. ☒ The allowed claim(s) is/are 38-86.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>20100604</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input checked="" type="checkbox"/> Other <u>replacement ABSTRACT.</u> |

/William W. Moore/
Examiner, Art Unit 1656

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee. All of the claims allowed herein, whether or not amended, are included below to assist the printer.

A substitute ABSTRACT is provided at page 8 of this communication.

Delete claim 87.

Amend claims 38, 53, 70, 76, 79-81, and 85 thus:

Claim 38. (Amended) An isolated ~~A~~ variant of a parent protease, comprising a substitution in at least one position selected from the group consisting of:

78-81; ~~82-100~~; 83-86; 88-100; 103-106; 111-114; and 118-131;

wherein

(a) the variant has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 90% but less than 100%;

(b) the variant has protease activity; and

(c) each position corresponds to a position of amino acids 1 to 188 of SEQ ID NO:2.

Claim 39. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 92%.

Claim 40. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 94%.

Claim 41. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 95%.

Claim 42. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 96%.

Claim 43. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 97%.

Claim 44. The variant of claim 38, which has a sequence identity to the sequence of amino acids 1 to 188 of SEQ ID NO:2 of at least 98%.

Claim 45. The variant of claim 38, which comprises a substitution at position 78.

Claim 46. The variant of claim 38, which comprises a substitution at position 79.

Claim 47. The variant of claim 38, which comprises a substitution at position 80.

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Claim 48. The variant of claim 38, which comprises a substitution at position 81.

Claim 49. The variant of claim 38, which comprises a substitution at position 83.

Claim 50. The variant of claim 38, which comprises a substitution at position 84.

Claim 51. The variant of claim 38, which comprises a substitution at position 85.

Claim 52. The variant of claim 38, which comprises a substitution at position 86.

Claim 53. The variant of claim 38, which further comprises a substitution at position 87 selected from the group consisting of T87A, T87C, T87D, T87E, T87F, T87G, T87H, T87I, T87K, T87L, T87M, T87N, T87P, T87Q, T87R, T87S, T87V, T87W, and T87Y.

Claim 54. The variant of claim 38, which comprises a substitution at position 88.

Claim 55. The variant of claim 38, which comprises a substitution at position 89.

Claim 56. The variant of claim 38, which comprises a substitution at position 90.

Claim 57. The variant of claim 38, which comprises a substitution at position 92.

Claim 58. The variant of claim 38, which comprises a substitution at position 93.

Claim 59. The variant of claim 38, which comprises a substitution at position 94.

Claim 60. The variant of claim 38, which comprises a substitution at position 95.

Claim 61. The variant of claim 38, which comprises a substitution at position 96.

Claim 62. The variant of claim 38, which comprises a substitution at position 97.

Claim 63. The variant of claim 38, which comprises a substitution at position 98.

Claim 64. The variant of claim 38, which comprises a substitution at position 99.

Claim 65. The variant of claim 38, which comprises a substitution at position 103.

Claim 66. The variant of claim 38, which comprises a substitution at position 105.

Claim 67. The variant of claim 38, which comprises a substitution at position 106.

Claim 68. The variant of claim 38, which comprises a substitution at position 111.

Claim 69. The variant of claim 38, which comprises a substitution at position 113.

Claim 70. (Amended) The variant of claim 38, which comprises at least one of the following substitutions:

78A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, T, V, W, Y;

79A, C, D, E, F, G, H, I, K, L, M, N, P, Q, S, T, V, W, Y;

80A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W;

81A, C, D, E, F, G, H, I, K, L, M, P, Q, R, S, T, V, W, Y;

83A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;

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84A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;

85A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W;

86C, D, E, F, G, H, I, K, L, M, N, P, R, S, T, V, W, Y;

~~87A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, V, W, Y;~~

88A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, W, Y;

89C, D, E, F, G, H, I, K, L, M, N, P, Q, R, V, W, Y;

90A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;

92P, R, K;

93P;

94C, P;

95E, D;

96E, D, P;

97R, K;

98P;

99R, K;

103C;

105C, P;

106C;

111R, K; ~~and/or and~~

113E, D.

Claim 71. The variant of claim 38, which comprises at least one of the following pairs of substitutions: 6C+103C; 8C+105C; 76C+85C; 94C+149C; and/or 106C+141C.

Claim 72. The variant of claim 38, which comprises at least one of the following substitutions: 81P; 92P; 93P; 94P; 96P; 98P; 105P; and/or 125P.

Claim 73. The variant of claim 38, which comprises at least one of the following substitutions: 81E, D; 84E, D; 89E, D; 95E, D; 96E, D; 113E, D; 120E, D; 129E, D; and/or 130E, D.

Claim 74. The variant of claim 38, which comprises at least one of the following substitutions: 92R, K; 97R, K; 99R, K; 111R, K; 118R, K; 122R, K; 124R, K; and/or 127R, K.

Claim 75. The variant of claim 38, which comprises at least one of the following substitutions: 81P; 84D, E; 85C; 92P, R, K; 93P; 94C, P; 95E, D; 96E, D, P; 97R, K; 98P; 103C; 105C, P; 106C; 122R, K; 124R, K; and/or 127R, K.

Claim 76. (Amended) The variant of claim 38, which comprises at least one of the following substitutions:

S78A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, T, V, W, Y;

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R79A, C, D, E, F, G, H, I, K, L, M, N, P, Q, S, T, V, W, Y;
Y80A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W;
N81A, C, D, E, F, G, H, I, K, L, M, P, Q, R, S, T, V, W, Y;
G83A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;
G84A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;
Y85A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W;
A86C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;
~~T87A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, V, W, Y;~~
V88A, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, W, Y;
A89C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;
G90A, C, D, E, F, H, I, K, L, M, N, P, Q, R, S, T, V, W, Y;
H91T, S;
N92P, R, K, S;
Q93P;
A94C, P;
P95A, E, D;
I96A, E, D, P;
G97R, K;
S98P;
S99A, Q, R, K;
V100I;
S103C;
S105C, P;
T106C;
C111R, K;
T113E, D;
I114V;
G118N, R, K;
S120T, E, D;
S122R, K;
P124R, K;
E125P, Q;
T127R, K;
T129E, D, Y, Q;
N130E, D; and/or

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M131L.

Claim 77. A detergent composition comprising a variant of claim 38 and a surfactant.

Claim 78. An animal feed additive comprising at least one variant of claim 38, and

- (a) at least one fat soluble vitamin;
- (b) at least one water soluble vitamin; and/or
- (c) at least one trace mineral.

Claim 79. (Amended) An animal feed composition having a crude protein content of 50 to 800 g/kg and comprising ~~a the~~ variant of claim 38.

Claim 80. (Amended) A method for improving the nutritional value of an animal feed comprising at least one protein, comprising adding a variant of claim 38 to the animal feed in an amount adequate for improving the nutritional value of the animal feed.

Claim 81. (Amended) A method for the proteolytic treatment of proteins, comprising
(a) adding a variant of claim 38 to a composition comprising proteins; and
(b) incubating the composition and variant for a time sufficient for treating proteins in the composition.

Claim 82. An isolated nucleic acid sequence comprising a nucleic acid sequence which encodes a variant of claim 38.

Claim 83. A nucleic acid construct comprising the nucleic acid sequence of claim 82 operably linked to one or more control sequences that direct the production of the variant in a suitable expression host.

Claim 84. A recombinant expression vector comprising the nucleic acid construct of claim 83.

Claim 85. (Amended) An isolated A recombinant host cell comprising the nucleic acid construct of claim 83.

Claim 86. A method for producing a variant having protease activity, comprising:

- (a) cultivating the host cell of claim 85 to produce a supernatant comprising the variant; and
- (b) recovering the variant.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Elias J. Lambiris on 23 July 2010.

The following is an examiner's statement of reasons for allowance:

Claims 38, 53, 70, and 76 are amended above to avoid double patenting issues regarding otherwise conflicting subject matters of claims Sjøholm et al., **US 6,855,548**, and Oestergaard et al., **US 7,588,926**. Claims 38 and 84 are amended to describe statutory subject matter, claim 79

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is amended to correct an informality, claim 80 is amended to state a complete method by incorporating elements of the disclosure at pages 27 and 28 of the specification and claim 81 is amended to state a complete method by incorporating elements of the disclosure at pages 40 and 41 of the specification, thus claims 38-86 as amended above are allowed herewith.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William W. Moore whose telephone number is 571.272.0933 and whose FAX number is 571.273.0933. The examiner can normally be reached Monday through Friday between 9:00AM and 5:30PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisory Primary Examiner, Manjunath Rao, can be reached at 571.272.0939. The official FAX number for all communications for the organization where this application or proceeding is assigned is 571.273.8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571.272.1600.

/William W. Moore/
Examiner, Art Unit 1656

/David J. Steadman/
Primary Examiner, Art Unit 1656

ABSTRACT

The invention relates to a novel 3D structure determined for a *Nocardiopsis* protease, as well as to variants of parent protease homologous to *Nocardiopsis* proteases, preferably of improved thermostability and/or with an altered temperature activity profile. The invention also relates to DNA sequences encoding such variants, their production in a recombinant host cell, as well as methods of using the variants, in particular within the field of animal feed and detergents. The invention further relates to methods of generating and preparing protease variants having different properties.